

REMARKS

Claims 1-13 are pending in this application. By this Amendment, 1, 2, 7 and 8 are amended for consistency. No new matter is added by this Amendment. Support for the language added to claims 1 and 7 can be found in original claims 2 and 8, respectively.

I. Rejection Under 35 U.S.C. §102(b)

Claims 1-13 were rejected under 35 U.S.C. §102(b) as allegedly being anticipated by JP 10-309455 ("JP '455"). This rejection is respectfully traversed.

The Patent Office alleges that JP '455 teaches a fluorine based surface-active agent, which is prepared from a copolymer containing an ethylene unsaturated monomer (A) having a fluoroalkyl group and an ethylene unsaturated monomer (B) having a branching aliphatic hydrocarbon group. The Patent Office specifically alleges that:

(1) monomer (A) taught by JP '455 corresponds to monomer (A) as recited in claims 1 and 7,

(2) ethylene unsaturated monomer (C) taught by JP '455 corresponds to monomer (C) recited in claims 1 and 7,

(3) ethylene unsaturated monomer (D) of JP '455 may correspond to monomer (C) as recited in claims 1 and 7, and

(4) ethylene unsaturated monomer (E) of JP '455 corresponds to monomers (B), (C) and (D) as recited in claims 1 and 7.

In summary, the Patent Office alleges that the monomers recited in claims 1 and 7 correspond to the monomers taught by JP '455 in the following manner:

Recited monomer (A) → Monomer (A) of JP '455

Recited monomer (B) → Monomer (E) of JP '455

Recited monomer (C) → Monomer (C), (D) and (E) of JP '455

Recited monomer (D) → Monomer (E) of JP '455.

Applicants respectfully disagree with the Patent Office's allegations that JP '455 teaches or suggests the surface tension control agent recited in claim 1, or the coating material recited in claim 7.

Applicants respectfully point out that claims 1 and 7 recite a fluorine-containing (meth)acryl type copolymer obtained by copolymerization of monomer consisting of: monomer (A), monomer (B), monomer (C) and optionally monomer (D). The "consisting of" language recited in the claims limits the fluorine-containing (meth)acryl type copolymer to having only these four monomers.

In contrast, JP '455 teaches an ethylene unsaturated monomer (B) having a branching aliphatic hydrocarbon group. Applicants submit that this monomer (B) as taught by JP '455 does not correspond to any of the monomers recited in the present claims. Even according to the Patent Office's allegations, this monomer (B) taught by JP '455 does not correspond to any of the monomers recited in claims 1 and 7. See the listing of allegedly corresponding monomers above.

As such, JP '455 cannot teach or suggest the surface tension control agent comprising fluorine-containing (meth)acryl type copolymer as recited in claim 1, or coating material fluorine-containing (meth)acryl type copolymer comprising fluorine-containing (meth)acryl type copolymer as recited in claim 7.

Applicants thus submit that the Patent Office has essentially ignored the "consisting of" recitation found in claims 1 and 7.

Furthermore, the Patent Office alleges that JP '455 teaches that the ratio of (A) to {(B)+(C)} in the copolymer is in the range of 3-60 parts by weight to 40-97 parts by weight. Specifically, JP '455 teaches that the weight ratio of (A)/(B)/(C)/(D) = 5-50/80/95/0-30 and the weight ratio of [(A)+(B)+(C)+(D)]/(E) = 20/80. However, Applicants submit that it is unclear how the teachings of JP '455 can correlate to the ratio of (A) to {(B)+(C)} in the

copolymer being in the range of 3-60 parts by weight to 40-97 parts by weight as recited in claims 1 and 7 when monomer (E) of JP '455 allegedly corresponds to monomers (B), (C) and (D) of the present claims, and monomers (C), (D) and (E) of JP '455 allegedly all correspond to monomer (C) of the present claims. Applicants submit that although the Patent Office alleges that the ratio taught by JP '455 is within the range recited in the claims, it is unclear how the Patent Office arrived at this conclusion.

Applicants thus submit that JP '455 does not teach or suggest (1) a surface tension control agent or coating material comprising a fluorine-containing (meth)acryl type copolymer obtained by copolymerization of monomer consisting of: monomer (A), monomer (B), monomer (C) and optionally monomer (D), and (2) that the ratio of (A) to {(B)+(C)} in the copolymer is in the range of 3-60 parts by weight to 40-97 parts by weight, as required in claims 1 and 7.

In addition, in JP '455, the monomer (A) having a fluoroalkyl group and the monomer (B) having the branched group are co-polymerized to prepare the copolymer. The copolymer has a random arrangement of the monomers due to steric hindrance of the branched group of monomer (B). Therefore, it is difficult to decrease the surface tension of the liquid coating material of the copolymer and the liquid coating material has weak antifoamability, because only a part of the fluoroalkyl groups is thinly exposed on the surface of the liquid coating material. When the solvent is volatilized from the liquid coating material, thereby forming a layer, molecular motions of the copolymer within the layer are obstructed by the steric hindrance of the branched group in JP '455. Therefore, part of the fluoroalkyl groups remain thinly exposed on the surface of the layer. Consequently, the layer provides water-repellent and oil-repellent qualities, without wettability or insufficient overcoatability.

In the present disclosure, the monomer (A) having the fluoroalkyl group and the monomer (B) having the straight chain are copolymerized to prepare the claimed copolymer.

The copolymer has thick and tidy arrangements of the monomers, because all of the fluoroalkyl groups are aggregated by van der Waals force in order to evade electrostatic repulsion of the monomer units of the copolymer having less steric hindrance. Therefore, a liquid coating material of the copolymer and solvent described in the present disclosure decreases surface tension and increases antifoamability, because the fluoroalkyl groups are thick and tidily exposed on the surface of the liquid coating material and the hydrophilic groups are hidden under the surface of the material. When the solvent is volatilized from the liquid coating material, thereby forming a layer, molecular motions of the copolymer having less steric hindrance in the layer are free. Therefore, the fluoroalkyl groups and the hydrophilic groups are reversed respectively and the hydrophilic groups are exposed on the surface of the layer. Consequently, the layer is not able to provide water-repellent and oil-repellent qualities, and has excellent wettability and sufficient overcoatability.

As such, Applicants submit that JP '455 does not teach or suggest the presently claimed surface tension control agent or the presently claimed coating material.

For the foregoing reasons, Applicants submit that JP '455 does not teach or suggest all of the features recited in the present claims. Reconsideration and withdrawal of the rejection are thus respectfully requested.

II. Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1-13 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

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